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CONTRIBUTIONS FROM THE GRAY HERBARIUM OF HARVARD
UNIVERSITY, NEW SERIES, No. XI.

By J. M. GREENMAN.

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I. — REVISION OF THE MEXICAN AND CENTRAL
AMERICAN SPECIES OF HOUSTONIA.

HOUSTONIA, Gronov. (Named in honor of Dr. William Houston, born in Scotland, 1695, died in Jamaica, 1733.) — Calyx-tube usually a little compressed; lobes 4, often with one or more minute teeth in each sinus, erect or spreading, persistent, later becoming widely separated. Corolla funnelform or salverform, 4-lobed, glabrous or pilose in the throat; lobes valvate. Stamens 4, inserted in the throat of the corolla; filaments short or elongated; anthers dorsally affixed, oblong or linear. Disk inconspicuous. Ovary 2-celled; style terete, slender, short or elongated; stigmas 2, linear or linear-oblong; ovules in each cell few or many, centrally attached to the median placenta. Capsule $\frac{1}{4}$ to $\frac{3}{4}$ inferior, more or less subglobose, obovate, obovate-oblong, or turbinate; seeds crateriform, acetabuliform, or oblong, peltate and slightly concave on the hilar surface, usually scrobiculate; albumen horny; embryo clavate. — Gronov. in L. Syst. Nat. ed. 1; L. Gen. no. 70; Benth. & Hook. f. Gen. ii. 60; Gray, Syn. Fl. N. A. i. pt. 2, 24; Schumann in Engl. & Prantl, Nat. Pflanzenf. iv. Ab. 4, 27. *Poiretia*, Gmel. Syst. 263. *Panetos*, Raf. Ann. Gen. Sci. Phys. v. 227, vi. 81. *Chamisma*, Raf. in Steud. Nom. ed. 2, i. 776, in syn. — Low slender annuals, herbaceous perennials, or suffrutescent plants with reciprocally dimorphous flowers.

§ 1. **EUHOUSTONIEÆ**. Low herbaceous plants often much branched from a woody perennial base: leaves ovate, oblong, linear or subterete, not rigid-setaceous nor aciculate-linear: capsule globose, obovate, or oblong-obovate, more or less compressed and usually emarginate: seeds crateriform, acetabuliform, or oblong, peltate and slightly concave on the hilar surface, scrobiculate. — Gray, Proc. Am. Acad. iv. 313.

- * Low slender creeping or erect annuals or perennials: flowers usually small on axillary or terminal pedicels or disposed in terminal cymes: capsule obcordate-depressed or oblong, emarginate, one half to three fourths inferior; seeds deep-crateriform, open-crateriform, or oblong, peltate and slightly concave on the hilar surface, usually scrobiculate.
- + Perennial by filiform rootstocks or creeping stems: flowers axillary or on slender terminal pedicels.

H. CÆRULEA, L., Sp. Pl. i. 105, accredited to Mexico by Hemsley (Biol. Centr.-Am. Bot. ii. 30), is essentially a more northern plant, and probably does not extend into Mexico.

H. serpyllacea, C. L. Smith, in herb. A low prostrate or creeping perennial: stems quadrangular, suffrutescent: branches ascending, 3 to 5 cm. high, glabrous: leaves elliptic-ovate, short-petiolate, acute, glabrous on either surface, margin revolute, hispidulous; stipules 1-2-long-setiferous with several shorter glandular setæ: flowers on short axillary pedicels: calyx-divisions lanceolate, acute, somewhat foliaceous, 2 to 4 mm. long; corolla funnelform, about 1 cm. long; lobes above and the throat pubescent: capsule oblong-obovate, 4 mm. long, one half as broad, about three fourths inferior; seeds (6 or more) oblong-rotund or a little oblique, peltate, slightly concavo-convex, prominently scrobiculate. — *Hedyotis serpyllacea*, Schlecht. Linnæa, ix. 599. *Mallastoma Shannoni*, Donnell Smith, Bot. Gaz. xviii. 203. — Jalapa, Schiede; C. L. Smith at Cruz Verde near Jalapa, altitude 2,150 m., no. 1486; Chiapas, Ghiesbreght, no. 814; Guatemala at San Miguel Uspantan, Depart. Quiché, altitude 2,150 m., Heyde and Lux (no. 3176 of Donnell Smith's sets).

- + + Delicate annuals with minute white flowers and erect or spreading corolla-lobes; seeds open-crateriform, oblong-rotund with a short hilar ridge.

H. croftiæ, Britton & Rusby. A depressed annual: stems 1 to 2 cm. long, hirtellous with a few scattered hairs, especially near the nodes: leaves oblanceolate, 5 to 15 mm. long, glabrous or with a few scattered hirsutish hairs on the midrib above, margins revolute, ciliate: stipules scarious, lacinate-dentate: flowers minute on short axillary pedicels: calyx including the ovary 2 mm. long, hirsute-pubescent; lobes acute: corolla white, 3 mm. long; lobes above short-pubescent: capsule depressed-globose, subdidymous, about one fourth inferior, the free portion short-hirsute-pubescent: seeds open-crateriform, oblong-rotund with a short hilar ridge. — Trans. N. Y. Acad. Sci. vii. 10. — San Diego, Duval Co., Texas, Miss Mary B. Croft, no. 85.

H. parviflora, Holzinger, in litt. A low annual, branching from a single slender root: branches ascending, quadrangular, minutely hispidu-

lous upon the angles: lower leaves oblanceolate; upper gradually narrowed to linear, 7 to 17 mm. long: stipules broadly ovate, scarious, minutely denticulate: flowers minute in the axils near the ends of the branches: pedicels 1 to 6 mm. long: calyx glabrous; lobes linear-oblong, acutish, spreading or recurved, $1\frac{1}{2}$ to 2 mm. long: corolla white, equalling or slightly exceeding the lobes of the calyx; lobes erect, glabrous, about equalling the tube: capsule three fourths inferior; seeds open-crateriform, oblong-rotund, with a median hilar ridge. — Collected by J. E. Bodin, Round Rock, Texas, 10 March, 1890, no. 24.

+ + + Erect or low-spreading herbaceous perennials, 1 to 4 dm. high: leaves linear, linear-oblong, or ovate: inflorescence in terminal cymes: capsule obcordate-compressed, or oblong and a little nerved below, one half to three fourths inferior.

++ Erect herbaceous perennials: divisions of the calyx acute.

H. PURPUREA, L., Sp. Pl. i. 105, attributed to Mexico by Hemsley (Biol. Centr.-Am. Bot. ii. 30), apparently does not extend so far south. Gregg's no. 66, cited by Hemsley under the above species, is *Houstonia angustifolia*, Michx., var. *rigidiuscula*, Gray.

H. *angustifolia*, Michx. Erect, usually much branched from a woody perennial base: stems strict, quadrangular, glabrous: leaves linear to oblanceolate-linear, 1 to 5 cm. long, 1 to 5 mm. broad, often hispidulous upon the recurved margins and upon the midrib above: inflorescence cymose, corymbosely or paniculately branched; pedicels slender, erect, 2 to 8 mm. long: flowers dimorphous: calyx-lobes 1 to $1\frac{1}{2}$ mm. long, acute: corolla somewhat funnelform, about 6 mm. long; tube pubescent within; lobes pubescent above: capsule oblong-obovate, about three fourths inferior, the free portion usually a little exceeded by the persistent calyx-lobes; seeds slightly concavo-convex, distinctly scrobiculate. — Fl. i. 85; Gray, Syn. Fl. N. A. i. pt. 2, 26. *Hedyotis stenophylla*, Torr. & Gray, Fl. ii. 41. *Oldenlandia angustifolia*, Gray, Pl. Wright. ii. 68. — Northern Mexico, Texas, northward to Iowa and eastward to Florida. Mexico, Pringle, no. 2260; Texas, Lindheimer, no. 620; Berlandier, nos. 432, 681, 1062, 2413, 2560, etc.; Wright, nos. 239, 240, 1390; E. Hall, no. 285; Palmer, no. 396; Heller, no. 1661. Thurber's specimen, without number, collected at Indianola, seems to be a depauperate form of this species.

Var. *filifolia*, Gray. Stems profusely branched; leaves linear-filiform: capsule somewhat smaller. — Syn. Fl. N. A. i. pt. 2, 27. *Oldenlandia angustifolia*, Michx., var. *filifolia*, Chapm. Fl. 181. — Texas, between Fredericksburg and San Sabra, Thurber, no. 67; Florida, at

Key West, Blodgett; also Curtiss, no. 1137. Drummond's no. 116, and Havard's nos. 231, 232, from Texas, are somewhat intermediate between the species and variety.

Var. scabra, Wats. Flowers short-pedicellate: calyx somewhat hirsute-scabrous: corolla-lobes near the apex externally covered with hirsute hairs (especially in bud): capsule rather larger than in the species. — Proc. Am. Acad. xviii. 97. — Caracol Mountains, Coahuila, Palmer, no. 410; Monterey, Nueva Leon, Palmer, no. 2116.

Var. rigidiuscula, Gray. From 1 to 3 cm. high: leaves linear to linear-oblong, 1 to 2 cm. long, 1 to 5 mm. broad, rather rigid: pedicels somewhat shorter than in the species proper: calyx-divisions usually exceeding the free portion of the capsule. — Syn. Fl. N. A. i. pt. 2, 27, in part. — Carneras Pass, Coahuila, Pringle, no. 2855; Gregg, no. 66; Valley of San Luis Potosi, Schaffner, no. 614; Texas, Guadalupe Mountains, Havard, no. 233; Rio Brassos, Drummond, no. 73 (Florida, Rugel, no. 322, from Dr. Gray).

H. rupicola. Low, profusely branching from a woody perennial base: stems erect, 8 to 14 cm. high, 4-angled, glabrous: leaves linear, 5 to 15 mm. long, acute or submucronate, rather rigid: stipules triangular, acute or short acuminate, usually unequally setiferous-denticulate: flowers dimorphous, sessile or short-pedicelled, disposed in small cymules terminating the stems and branches: calyx-divisions small, acute, scarcely 1 mm. long: corolla narrowly funnelform, about 5 mm. long; lobes pubescent above: capsule globose, $1\frac{1}{2}$ mm. or less in length, about one half inferior; seeds oblong, peltate, slightly concave on the hilar surface, scrobiculate. — *H. fasciculata*, Gray, Syn. Fl. N. A. i. pt. 2, 27, as to plant Wright. *Hedyotis* (*Amphiotis*) *stenophylla*, var. *parviflora*, Gray, Pl. Wright. i. 81. — Crevices of rocks on the San Pedro River, Arizona, Wright, no. 238.

++ ++ Low, branching from the base: stems spreading or prostrate: divisions of the calyx obtuse.

H. salina, Heller. Low, spreading or prostrate: stems 8 to 10 cm. long, branching from a woody perennial base, glabrous: leaves oblong-linear, 5 to 15 mm. long, 2 to 5 mm. broad, essentially glabrous, margin volute: inflorescence in close subcapitate cymules terminating the stems and branches: flowers dimorphous: calyx-lobes short, scarcely 1 mm. long, obtusish, glabrous or hirtellous: corolla funnelform, 5 mm. long, pubescent in the throat; lobes pubescent above: capsule short-oblong, a little narrowed below, about three fourths inferior, the free portion about equalling the calyx-lobes; seeds as in the preceding species. — Contrib. Herb. Frank. & Marsh. Coll. no. 1, 96. *Houstonia*

angustifolia, Michx., var. *rigidiuscula*, Gray, Syn. Fl. N. A. i. pt. 2, 27, in part. — Corpus Christi, Texas, Palmer, without number, collected in 1879; Heller, no. 1812.

* * Low-tufted leafy species, 2 to 12 cm. high: pedicels reflexed in fruit: capsule one fourth inferior; seeds open-crateriform, oblong-rotund, with a median longitudinal ridge on the hilar surface.

+ Distinctly perennial, multicapital from a deep ligneous root.

H. Wrightii, Gray. Stems quadrangular, pruinose-puberulent: leaves linear or the lower narrowly spatulate, thickish, glabrous; stipules rather pronounced, broadly deltoid, entire or minutely denticulate: flowers dimorphous, 5 to 7 mm. long, in terminal leafy cymes: calyx-divisions lance-linear, acute, $1\frac{1}{2}$ to 2 mm. long, glabrous: corolla salver-shaped; tube $2\frac{1}{2}$ to 4 mm. long (depending upon the long- or short-styled form respectively), slightly enlarged above: seeds scrobiculate. — Proc. Am. Acad. xvii. 202, & Syn. Fl. N. A. i. pt. 2, 26. *H. humifusa*, Hemsl. Biol. Centr.-Am. Bot. ii. 30, not Gray. *Hedyotis* (*Houstonia*) *humifusa*, Gray, Pl. Wright. i. 82. *Oldenlandia* (*Houstonia*) *humifusa*, Gray, Pl. Wright. ii. 68, excl. syn. — State of Mexico, in meadows on the Sierra de las Cruces, elevation 3,000 m., Pringle, no. 5744; on the Serrania de Ajusco, altitude 3,000 m., Pringle, no. 6468; San Luis Potosi, elevation 1,800 to 2,460 m., Parry & Palmer, no. 301; in the vicinity of the city of Durango, Palmer, no. 312; Chihuahua, on the summits of Sierra Madre, Pringle, no. 2284; and on dry mountain sides, Chachuichupa, in the same State by C. V. Hartman, no. 705; New Mexico, Wright, no. 241, Thurber, nos. 717, 1121; Santa Magdalena Mountains, Vasey; near Santa Rita del Cobre, E. L. Greene; Arizona, at Fort Whipple, Coues & Palmer, no. 75; in the San Francisco Mountains near Clifton, E. L. Greene; Prescott, Dr. Smart, no. 460; Lemmon, nos. 2726, 512, 512 $\frac{1}{2}$; in the Rincon and Santa Rita Mountains, Pringle; at Willow Spring, Palmer, no. 523.

H. rubra, Cav. Much depressed, rather dense, 2 to 10 cm. high: stems and leaves hispidulous or nearly glabrous: leaves linear, or the lower oblanceolate-linear, 5 to 25 mm. long; stipules short with one or more setæ: flowers $1\frac{1}{2}$ to $2\frac{1}{2}$ cm. long, axillary: calyx-divisions linear, acute, in anthesis 2 mm. long, in fruit somewhat elongated: corolla red or purple varying to white; tube slender: capsule depressed, subrotund; seeds scrobiculate. — Ic. v. 48, t. 474, f. 1; Benth. Pl. Hartw. 15; Hemsl. Biol. Centr.-Am. Bot. ii. 30; Gray, Syn. Fl. N. A. i. pt. 2, 25. *Oldenlandia* (*Houstonia*) *rubra*, Gray, Pl. Wright. ii. 68. — Aguas Calientes, Hartweg, no. 93; Valley of San Luis Potosi, Schaffner,

no. 26; region of San Luis Potosi, altitude 1,800 to 2,460 m., Parry & Palmer, no. 300; hills and plains near Chihuahua, Pringle, no. 274; Sonora, south of San Luis, Parry, no. 6; Thurber, nos. 319, 707; without locality, Coulter, no. 196; New Mexico, Fendler, no. 291, Wright, no. 1119, Palmer, no. 93; Arizona, Wolf & Rothrock, no. 865; in the Huachuca Mountains, Lemmon, no. 2725, at Bisbee, F. E. Lloyd.

+ + Distinctly annual: stems dichotomously branched: corolla funnelform.

H. humifusa, Gray. A low annual: stems dichotomously branched, hispidulous: leaves linear or the lower oblanceolate, 1 to $1\frac{1}{2}$ cm. long, 1 to 5 mm. broad, mucronate, hispidulous above, margins revolute: stipules broad, scarious, and setiferous: flowers axillary, rather numerous above: calyx-divisions setaceous-subulate, 3 to 4 mm. long: corolla open-funnelform, 6 to 7 mm. long; lobes pubescent above: pedicels strongly recurved in fruit: capsule depressed-globose, subdidymous. — Proc. Am. Acad. iv. 314. *Hedyotis* (*Houstonia*) *humifusa*, Gray, Pl. Lindh. ii. 216. — New Mexico, Thurber, no. 292; Texas, Lindheimer, nos. 621, 622, 377, 378; E. Hall, no. 286; on sandy prairies near Austin, Wright; Belknap, Sutton Hayes, no. 333; Colorado City, Reverchon, no. 60; on sandy hills and plains near Sweetwater, Curtiss, no. 1140; also specimen cultivated in the Cambridge Botanic Garden in 1849.

* * * A low slender leafy stemmed annual, with small white flowers on spreading axillary pedicels: capsule three fourths inferior.

H. subviscosa, Gray. A delicate herb, 4 to 15 cm. high: stems branched from the base: branches spreading, covered with a subviscid hirtellous pubescence: leaves linear-filiform, 5 to 15 mm. long, glabrous or hirtellous: stipules short, scarious, minutely setulose-ciliate: pedicels filiform, 3 to 8 mm. long, horizontally spreading but scarcely reflexed in fruit: calyx hirtellous-pubescent; divisions acute, about 1 mm. long: corolla salverform, about 3 mm. long: capsule subdidymous, broader than long; seeds open-crateriform, minutely scrobiculate. — Proc. Am. Acad. iv. 314. — *Oldenlandia subviscosa*, Wright in Gray, Pl. Wright. ii. 68. — Southern Texas, Berlandier, nos. 991, 2421, and Wright, without number.

* * * * Slender diffuse herbs, or perennials, 5 to 25 cm. high: stems more or less dichotomously branched, often becoming slightly woody below: leaves linear, subterete or filiform, shorter than the internodes: pedicels erect or spreading in fruit.

+ Low delicate annuals: calyx adnate nearly to the top of the ovary: capsule clavate-turbinate or subglobose.

H. Brandegeana, Rose. Erect or ascending, 5 to 10 cm. high, freely branching from the base: stems filiform, hispidulous-puberulent:

basal leaves narrowly spatulate, 5 to 8 mm. long; the upper gradually narrowed, hispidulous-puberulent above, glabrous beneath: pedicels elongated, filiform: flowers small, 4 to 6 mm. long: calyx-divisions short, scarcely 1 mm. in length, obtuse: corolla funnelform: capsule subglobose, $1\frac{1}{2}$ mm. long. — Contrib. U. S. Nat. Herb. i. 70. — Lower California, La Paz, Palmer, no. 31.

H. asperuloides, Gray. Much branched from the base, 5 to 18 cm. high: branches divaricately spreading and ascending, inconspicuously hispidulous-puberulent or quite glabrous: leaves linear or a little dilated above the middle, 5 to 24 mm. long, glabrous: flowers on slender filiform pedicels: calyx-lobes lance-linear, $1\frac{1}{2}$ to 2 mm. long, acute, slightly unequal: corolla funnelform, about 8 mm. long; tube below puberulent on either surface: capsule clavate-turbinate, tapering below; seeds oblong, peltate, somewhat concavo-convex, minutely scrobiculate. — Proc. Am. Acad. v. 158; Rose, Contrib. U. S. Nat. Herb. i. 70. *Hedyotis* (*Ericotis*) *asperuloides*, Benth. Bot. Sulph. 19, t. 13. — Lower California, Cape St. Lucas, Xantus, no. 43; at La Paz, Palmer, nos. 24, 31^a; and by Brandegee, 5 February, 1890, the latter distributed as *Houstonia Brandegeana*, Rose.

H. arenaria, Rose. Erect or ascending, glabrous throughout: stems much branched: upper leaves linear or linear-lanceolate, $1\frac{1}{2}$ to 2 cm. long: stipules short, scarious, laciniate: inflorescence in loose terminal dichotomous cymes with the terminal flower sessile: calyx-lobes about 1 mm. long, obtusish, inconspicuously serrulate on the margins: corolla about 4 mm. long, funnelform; lobes spreading, broadly ovate: capsule obcordate-compressed, $1\frac{1}{2}$ mm. long; seeds oblong, peltate, slightly concavo-convex, scrobiculate. — Contrib. U. S. Nat. Herb. i. 70. — Lower California, La Paz, Palmer, no. 28; San Jose del Cabo, Brandegee, no. 261.

+ + Low dichotomously branched perennials: stems becoming slightly woody below: ovary one half to three fourths inferior: capsule short-oblong or subglobose.

+ + Stems rather leafy: capsule about 3 mm. long.

H. Palmeri, Gray. Erect, profusely branched: branches hirtellous-puberulent or glabrous: leaves linear-filiform, glabrous, 5 to 18 mm. long; stipules small, subtruncate, minutely dentate, or triangular-acute: pedicels slender, erect or ascending: flowers about 1 cm. long, dimorphous: calyx-divisions lance-linear, 2 mm. long, ciliate: corolla salver-shaped or slightly funnelform, upper portion of tube pubescent within: free portion of capsule often hirtellous; seeds open-crateriform, oblong-

rotund with a longitudinal hilar ridge on the ventral surface, scrobiculate. — Proc. Am. Acad. xvii. 202. — Northern Mexico, Coahuila, in the region of Saltillo, Palmer, nos. 397, 398, and in the same State on limestone hills, Carneros Pass, Pringle, no. 2381.

++ ++ Leaves much reduced: capsule about 2 mm. long.

H. longipes, Watson. Erect, much branched, 1 to $2\frac{1}{2}$ dm. high: stems and branches subterete, slender, glabrous or below granular-hirtellous: leaves linear-filiform, 4 to 10 mm. long, glabrous; stipules minute: flowers small, "whitish and yellowish," 8 mm. long, on slender filiform pedicels: calyx-divisions linear, about 1 mm. long, obtusish and submucronate: corolla funnelliform, upper portion of tube pubescent within; lobes pilose-pubescent above: capsule small, subrotund; seeds saucer-like or subcrateriform with a longitudinal ridge on the hilar surface, scrobiculate. — Proc. Am. Acad. xviii. 97. — Near Monclova, Coahuila, Palmer, no. 394, and by the same collector at Monterey, Nueva Leon, no. 395; also by Dr. Gregg at Cerralbo, collected 29 May, 1847.

H. brevipes, Rose. A low much branched distinctly suffrutescent plant, 2 to 3 dm. high, glabrous throughout, somewhat glaucous: branches slender, terete: leaves linear-filiform, 10 to 15 mm. long; stipules short, 1-4-setiform: flowers sessile or on slender pedicels: calyx deeply 4-lobed, with a stipitate gland in each sinus: divisions in anthesis about 1 mm. long: corolla salverform, 10 to 15 mm. long; tube slender, slightly enlarged above; lobes glabrous above: capsule subglobose; seeds oblong, peltate, concavo-convex, minutely scrobiculate. — Contrib. U. S. Nat. Herb. i. 83, 132. — Lower California, Santa Rosalia, Palmer, no. 202; Carmen Island, Palmer, no. 836; also specimen in Gray Herbarium from Lower California, apparently from the herbarium of Dewey, without further data.

§ 2. EREICOTIS. Fruticose or fruticulose plants with linear subterete rigid-setaceous or acerose-linear leaves: capsule short-oblong, obtuse or retuse; seeds open-crateriform or oblong, peltate, minutely scrobiculate. — Gray, Proc. Am. Acad. xvii. 203.

* Low, 2 to 18 cm. high, much branched from a woody perennial base: leaves rigid-setaceous or acerose-linear.

H. acerosa, Gray. A low diminutive caespitose shrub: branches ascending or erect, strict, striate, hispidulous: leaves opposite or in threes or fours, 5 to 12 mm. long, connected at the base by a stipular setiferous cup, more or less hispid and ciliate: flowers sessile at the ends of the branches and branchlets: calyx deeply 4-parted; divisions setaceous, 4 mm. long, hispidulous: corolla-tube slender, about 1 cm. long, dilated

at the throat, almost funnelform: capsule about two thirds inferior, globose or short-oblong, obtuse or slightly retuse, pubescent, much exceeded by the erect persistent calyx-divisions; seeds more or less crateriform, somewhat roughened on the back. — Proc. Am. Acad. xvii. 203, & Syn. Fl. N. A. i. pt. 2, 27; Hemsl. Biol. Centr.-Am. Bot. iv. 47. *Hedyotis* (*Ereicotis*) *acerosa*, Gray, Pl. Wright. i. 81. *Oldenlandia* (*Ereicotis*) *acerosa*, Gray, Pl. Wright. ii. 67. *Mallostoma acerosa*, Hemsl. Biol. Centr.-Am. Bot. ii. 31. — Northern Mexico, Parry, nos. 7, 302, Gregg, no. 72, Palmer, nos. 400, 401, 402, 403; adjacent Texas, Wright, nos. 237 (type), 1118, Thurber, no. 91, and Bigelow.

H. polypremoides, Gray. Low, caespitose, 6 to 15 cm. high, much branched from a woody perennial base: stems strict, ascending or erect, usually branched above, glabrous or densely hirtellous-puberulent: leaves less fascicled than in the preceding species, acerose-linear, 5 to 10 mm. long, glabrous or hirtellous, margin revolute, often ciliate, midrib thickened: flowers dimorphous, sessile or distinctly pedicellate, terminating the stems and branches; pedicels elongated in fruit, reaching a length of 13 mm.: calyx-divisions awl-shaped, 3 to 4 mm. long: corolla salverform or slightly funnelform, "white changing to purple," 8 to 10 mm. long: capsule globose, about two thirds inferior; seeds open-crateriform, oblong-rotund with a short hilar ridge. — Proc. Am. Acad. xxi. 379. — Chihuahua, Santa Eulalia Mountains, Pringle, nos. 16, 356; on route from Leavenworth to El Paso, F. R. Diffenderffer; at junction of Delaware Creek and Pecos River, Texas, Pope.

Var. Bigelovii. A form with the calyx-lobes $1\frac{1}{2}$ to 2 mm. long, otherwise as in the type. — Florence Mountains, Bigelow, in the Mexican Boundary Survey, June, 1852, no. 437.

* * Distinctly shrubby, $2\frac{1}{2}$ dm. or more high, much branched: leaves thickish, more or less fascicled: inflorescence in cymes terminating the stems and branches.

← Leaves 3 to 10 mm. in length, much fascicled: corolla 3 to 4 mm. long.

H. fasciculata, Gray. A low bushy shrub, much branched: stem and branches covered with a grayish bark: branchlets tetragonal, hirtellous-puberulent: leaves linear, subterete, thick, rigid, nearly equalling the internodes, decidedly fascicled in the axils, glabrous or hirtellous, margin revolute; stipules short, scarious, 1 to 3 setiferous-dentate: cymes few-flowered: flowers small, "white, drying purple," dimorphous: calyx-divisions short, about 1 mm. long, obtuse, usually puberulent: corolla deeply 5-lobed; lobes recurved; tube long-pilose-pubescent on the inner surface: capsule oblong; seeds oblong, peltate, concavo-convex, minutely

scrobiculate. — Proc. Am. Acad. xvii. 203. — In the mountains, 24 miles N. E. of Monclova, Coahuila, Palmer, nos. 404, 406; Santa Eulalia Mountains, Chihuahua, Pringle, nos. 151, 354; adjacent Texas, at Presidio, Bigelow, in Mexican Boundary Survey; foothills of Chisos Mountains, Havard, No. 31; and in the Organ Mountains, New Mexico, Vasey, 1881.

+ + Leaves 3 to 18 mm. in length: corolla 10 to 14 mm. long.

H. fruticosa, Rose. Low much branched shrub, glabrous throughout: stem and branches covered with a rough yellowish brown or grayish bark: leaves linear or somewhat thickened and subterete, submucronate, more or less fascicled in the axils; stipules short, glandular-setiferous: inflorescence in terminal rather few-flowered dichotomous cymes; flowers subsessile or short pedicellate: calyx deeply 5-lobed with a single stipitate gland in each sinus; lobes linear-lanceolate, about 3 mm. long, foliaceous: corolla about 3 times longer than the calyx; tube narrowly funnel-shaped, glabrous: capsule short, oblong, subtruncate or slightly emarginate; seeds oblong, peltate, concavo-convex, minutely scrobiculate. — Contrib. U. S. Nat. Herb. i. 132, 239. *Hedyotis* (*Ericotis*) *mucronata*, Benth. Bot. Sulph. 19. — Magdalena Island, Lower California, Brandegee, 17 January, 1889; Carmen Island, Palmer, no. 885.

§ 3. *MACROHOUSTONIA*. Erect shrubby plants with ovate leaves and rather large flowers. — Gray, Proc. Am. Acad. iv. 314. A section scarcely to be retained.

H. bouvardioides, Benth. & Hook. f. Shrub 3 to 4 feet high: stems terete, granular-puberulent: leaves opposite or ternate, short-petiolate, ovate or elliptic-lanceolate, acute or short-acuminate, entire, finely puberulent upon either surface, especially upon the midrib and veins: inflorescence in terminal compound minutely pubescent cymes: calyx deeply 4-parted; divisions linear, 3 mm. long: corolla funnelform, about 12 mm. long, glabrous, rather deeply 4-lobed; tube with a few scattered hairs on the inside toward the base; lobes oblong, obtuse: anthers long-exserted: style included (probably dimorphous); ovules rather numerous: seeds not seen. — Gen. ii. 60; Hemsl. Biol. Centr.-Am. Bot. ii. 30. *Hedyotis* (§ *Anotis*) *bouvardioides*, Seem. Bot. Herald, 296, t. 64. — N. W. Mexico, Seemann. A plant having much more in common with *Bouvardia* than with *Houstonia*, but without fruit or mature seeds it seems unwise to make the transfer. More complete specimens, however, may justify its removal to the former genus.

H. (MACROHOUSTONIA) LONGIFLORA, Gray, Proc. Am. Acad. iv. 314, Hemsl. Biol. Centr.-Am. Bot. ii. 30, is *Bouvardia longiflora*, HBK.,

Nov. Gen. & Spec. iii. 386; Bot. Mag. 4223. *Æginetia longiflora*, Cav. Ic. vi. 51, t. 257, f. 1.

H. (MACROHOUSTONIA) TRIFLORA, Gray, l. c., Hemsl. l. c., is a good *Bouvardia*.

From the technical characters of complete specimens of the last two species, now at hand, there seems no reason for retaining them in the genus *Houstonia*.

II. KEY TO THE MEXICAN SPECIES OF LIABUM.

* Leaves ovate or ovate-deltoid: heads radiate.

+ Leaves ovate-deltoid, more or less deeply sinuate-dentate and mucronate-denticulate: heads few, large (3 to 5 cm. in diameter), terminating the stem.

L. *Andrieuxii*, Benth. & Hook. f. Gen. ii. 437. *Vernonia Andrieuxii*, DC. Prodr. v. 16.

+ + Leaves ovate, entire or mucronate-denticulate: heads disposed in terminal panicles.

+ + Pappus of slender unequal setæ, not biseriate.

= Involucral scales lance-attenuate: petioles winged and often dilated about the stem: ligules narrow: achenes pubescent.

L. *asclepiadeum*, Schz. Bip. Linnæa, xx. 521.

= = Involucral scales oblong, obtuse: ligules ovate: achenes glabrous.

L. *polyanthum*, Klatt, Bull. Soc. Bot. Belg. xxxi. (1892), 209.

+ + Pappus distinctly biseriate, outer series short, paleaceous.

= Achenes pubescent.

L. *andromachioides*, Benth. & Hook. f. Gen. ii. 436. *Vernonia andromachioides*, Less. Linnæa, vi. 397, 645.

L. *Deppeanum*, Hemsl. Biol. Centr.-Am. Bot. ii. 232. *Andromachia Deppeana*, Less. Linnæa, vi. 401.

= = Achenes glabrous.

L. *platylepis*, Schz. Bip. Flora, 1856, 160; Klatt, Leopoldina, xxiii. (reprint, p. 7).

L. *discolor*, Benth. & Hook. f. Gen. ii. 436. *Sinclairia discolor*, Hook. & Arn. Bot. Beech. 433; Hook. Ic. Pl. v. t. 451.

* * Leaves ovate or ovate-lanceolate: heads discoid.

+ Inflorescence in loose terminal pyramidal panicles: involucre 3-5-seriate: pappus biseriate.

+ + Immature achenes stipitate-glandular: involucral scales obtuse.

L. *glabrum*, Hemsl. l. c.